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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/784,251	02/24/2004	Pei Choa Wang	OP-093000041	1177

7590
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06/18/2004

EXAMINER

FLETCHER III, WILLIAM P

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 06/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/784,251

Applicant(s)

WANG, PEI CHOA

Examiner

William P. Fletcher III

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– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –
 Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 February 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
 Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
 Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 1 objected to because of the following informalities:
 - a. “for use in a container in any profile” should, apparently, read “for use in a container having and profile”; and
 - b. “vaporizing liquid of the powder metal mixture” should, apparently, read “vaporizing liquid from the powder metal mixture” or “vaporizing the liquid of powder metal mixture”.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. **Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

The term “smooth” in claim 1 is a relative term which renders the claim indefinite. The term “smooth” is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Since no criteria are given by which one of ordinary skill in the art may determine whether or not a surface is “smooth,” it is unclear what surfaces are considered “smooth” within the context of applicant’s invention.

Similarly, the term “pure” in claim 5 is also a relative term which renders the claim indefinite. The term “pure” is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Since no criteria are given by which one of ordinary skill in the art may determine whether or not a given type/sample of water is “pure,” it is unclear what is considered “pure water” within the context of applicant’s invention.

Lastly, the term “stair-like” in claim 1 renders the claim indefinite. The precise metes and bounds of structures intended to be encompassed by this term is unclear. Precisely what substrate geometries may be considered “stair-like?” How closely must the substrate resemble a “stair” to be considered “stair-like?”

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 1, 2, and 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leonard et al. (US 4,885,129 A) in view of Wang (US 5,718,046 A) and Eastman (US 4,196,504 A).**

With respect to claim 1, Leonard teaches a method in which the interior surface of a pipe are coated with a metal powder slurry (abstract, for example). Predetermined amounts of metal powder and liquid are mixed together with relative proportions being adjusted to effect the viscosity of the slurry (4:67-5:13). The slurry is applied to the interior surface of the pipe and

the liquid is evaporated to form a layer of metal powder thereon (5:14-18). Leonard's disclosure is specifically drawn to the coating of a sintered metal heat wick layer on the inside of the pipe (1:1-3:2).

Since Leonard's pipe has one circumferentially continuous surface, it is the examiner's position that Leonard's pipe reads on applicant's claimed "container in any profile and having at least one [smooth] interior bottom surface." Since Leonard does not explicitly state that the interior surface is rough, roughened, or that steps are taken to otherwise improve the smoothness thereof, it is the examiner's position that the interior surface of Leonard's pipe reads on a "smooth interior bottom surface." Furthermore, insofar as Leonard's mixture is "pourable" (6:17-23) it is the examiner's position that this mixture reads on applicant's claimed "adjusted to allow fluent flow."

Leonard does not explicitly teach: (a) stirring the mixture; (b) vibrating the container; or (c) that the metal powder film is thinner than about 0.1 mm.

With respect to (a), it is the examiner's position that it is common and well-known to stir a slurry at some point prior to its application in order to maintain homogeneous distribution of the components of the mixture. Consequently, it would have been obvious to one of ordinary skill in the art to modify the method of Leonard so as to stir the slurry at some point prior to application. One of ordinary skill in the art would have been motivated to do so by the desire and expectation of maintaining homogeneous distribution of the components of the mixture.

With respect to (b), Leonard teaches that the pipe is rotated to ensure distribution of the slurry within the pipe (3:23-34). Wang teaches a method in which the internal surface of a metal article is coated with a metallic powder slurry (abstract, for example). The article is vibrated to

ensure that the entire surface is wetted by the slurry (4:7-13). Consequently, it would have been obvious to one of ordinary skill in the art to modify the method of Leonard so as to, in addition to rotating the pipe, vibrating it. One of ordinary skill in the art would have been motivated to do so by the desire and expectation of further ensuring that the entire interior surface of the pipe is wetted with slurry, as suggested by Wang.

With respect to (c), although Leonard explicitly teaches controlling the thickness of the metal powder layer, this reference is silent with respect to the thickness of the layer. Eastman teaches a method of coating the interior surface of a pipe with a metal powder slurry. A representative thickness thereof is 0.010-0.020 in (0.254-0.508 mm) (4:50-58). It is noted that the term “about” was held to be clear, but flexible. *Ex parte Eastwood*, 163 USPQ 316 (Bd. App. 1968). It is the examiner’s position that Eastman’s teaching of 0.245 mm reads on applicant’s claimed thickness of “about 0.1 mm.” Consequently, it would have been obvious to one of ordinary skill in the art to modify the method of Leonard so as to apply the coating in a thickness of 0.245 mm which is about 0.1 mm. One of ordinary skill in the art would have been motivated to do so by the desire and expectation of successfully yielding an operative and effective heat wick for the pipe.

In the alternative, both Leonard and Eastman teach controlling the thickness of the layer (Leonard, 6:1-6 and Eastman, 2:29-37). It is the examiner’s position that the thickness of the heat wick layer is a result-effective variable. The layer must be thick enough to provide wicking for adequate volumes of liquid, while not being so thick as to make such wicking unduly slow. Consequently, absent clear and convincing evidence of unexpected results demonstrating the criticality of the claimed thickness, it would have been obvious to one of ordinary skill in the art

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to modify the method of Leonard so as to optimize the wicking layer thickness by routine experimentation (see MPEP § 2144.05(II)).

With respect to claim 2, as noted above, Leonard's pipe has one, circumferentially continuous, interior bottom surface.

With respect to claim 4, Leonard teaches that the metal powder may be copper (Cu) powder (3:47-49).

With respect to claim 5, Leonard teaches that the liquid includes water (4:67-5:13). Although this reference does not explicitly state that this water is "pure." It is the examiner's position that it would have been obvious to one of ordinary skill in the art to modify the method of Leonard so as to utilize, as the water, "pure" water. One of ordinary skill in the art would have been motivated to do so by the desire and expectation of reducing or eliminating contaminants and/or impurities in the coating slurry.

With respect to claim 6, Leonard further teaches that the coating is sintered (abstract and 5:18-35).

Allowable Subject Matter

6. Claim 3 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter: While the prior art teaches heat pipes with grooves therein (see Leonard 2:36-43) and sintered wicks with grooves therein (see Eastman, US 4,274,479 A), the prior art neither teaches nor suggests coating a sintered metal powder layer over the grooved pipe.

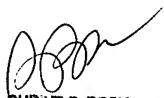
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William P. Fletcher III whose telephone number is (571) 272-1419. The examiner can normally be reached on Monday through Friday, 9 AM to 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive P. Beck can be reached on (571) 272-1415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

WPF 6/14/2004
William P. Fletcher III
Examiner
Art Unit 1762


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